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Nicholas E. Earnhart, Ph.D., ACTAR

Professional Profile

Dr. Earnhart specializes in the investigation and reconstruction of accidents, including those involving automobiles, bicycles, pedestrians, motorcycles, buses, heavy trucks, and industrial equipment. His expertise includes areas such as:

- Vehicle dynamics and performance; kinematics and work-energy methods
- Experimental methods, including crash testing, impact analysis, and crash simulation
- Data measurement, acquisition, and imaging, particularly for event data recorder imaging and interpretation for passenger vehicles and heavy trucks
- Collision evidence analysis for accident sequence, speed, severity, and rollover analysis

Dr. Earnhart's graduate research theoretically and experimentally investigated the behavior and performance of noise control devices using a compliant composite material for hydraulic systems. He has additional expertise in acoustical testing methods for loudness and sound transmission loss, and AC and DC electric motor design, production, and failure analysis.

Prior to Momentum PMV, Dr. Earnhart practiced accident reconstruction at InSciTech, Inc., was an engineering intern with Rolls Royce North America, and was an engineering co-op with GE Motors and Controls.

Academic Credentials and Professional Honors

Ph.D., Mechanical Engineering, Georgia Institute of Technology, 2012

M.S., Mechanical Engineering, Georgia Institute of Technology, 2009

B.S., Mechanical Engineering, Purdue University, 2007

Tau Beta Pi, Engineering Honor Society

Pi Tau Sigma, Mechanical Engineering Honor Society

Member, Society of Automotive Engineers (SAE)

Member, American Society of Mechanical Engineers (ASME)

Academic Credentials and Professional Honors *(Continued)*

Achievement Rewards for College Scientists (ARCS) Fellowship, 2011-2012
Georgia Institute of Technology President's Fellowship, 2007-2011
Distinguished Paper Award, 7th FPNI PhD Symposium, 2012
Leo Beranek Student Medal for Excellence in the Study of Noise Control, 2012
Best Poster, Georgia Tech ASA Poster Competition, 2010
Best Poster, North Carolina ASA Poster Competition, 2010

Seminars, Training, and Certifications

Toyota TechStream User's Course, 2024
Crash Data Group EDR Summit, 2024
SAE Accessing and Interpreting Heavy Vehicle Event Data Recorders, 2021
Crash Safety Solutions, 2020

- Driver & Rider Forward, Backing, & Lateral Acceleration
- Driver Responses at Curves, Obstacles, & Intersections
- Drivers' Responses at Traffic Signals & Intersections
- Path Intrusion Reaction Time Studies
- Pedestrian Walking Speed and Gap Acceptance
- Recognition - Closing Speed vs. Closing Threshold

SAE Vehicle Crash Reconstruction: Principles and Technology, 2020
Crash Data Group EDR Summit, 2019
sUAS Remote Pilot Certificate #3942997, 2016
SAE Vehicle Dynamics for Passenger Cars and Light Trucks, 2016
Certified Traffic Accident Reconstructionist, ACTAR #2795, 2015
SAE Commercial Braking Systems, 2014
SAE Introduction to Brake Control Systems, 2014
Crash Data Retrieval Technician, Levels 1 and 2, 2013

Archival Publications

Marek, K.A., Earnhart, N.E., and Cunefare, K.A. "Model and analysis of a cylindrical in-line hydraulic suppressor with a solid compressible liner." *Journal of Sound and Vibration*. 2014, doi: 10.1016/j.jsv.2014.07.006.

Wood, M., Earnhart, N., and Kennett, K., "Airbag Deployment Thresholds from Analysis of the NASS EDR Database," *SAE International Journal of Passenger Cars – Electronic and Electrical Systems*. 7(1):2014, doi:10.4271/2014-01-0496.

Earnhart, N.E. "Modeling and validation of a syntactic foam lining for noise control devices for fluid power systems." PhD Thesis. 2012.

Earnhart, N.E. and Cunefare, K.A. "Compact Helmholtz resonators for fluid power systems." *International Journal of Fluid Power*. Vol. 13 (2012) No. 1, pp. 41-50.



Conference Publications

Earnhart, N.E., Marek, K.A., and Cunefare, K.A.. "The role of compliance in devices for reduction of fluid-borne noise. Proceedings of the 7th FPNI PhD Symposium on Fluid Power, Reggio Emilia, Italy, 27-29 June 2012. CD Proceedings.

Marek, K.A., Earnhart, N.E., and Cunefare, K.A. "Compliant-wall methods for fluid-borne noise reduction." Proceedings of the 162nd Meeting of the Acoustical Society of America, San Diego, CA, 31 October – 4 November 2011.

Cunefare, K.A., Earnhart, N.E., Walsh, M., Erdirisinghe, R., Marek, K.A. "Noise control devices for fluid systems." Proceedings of NoiseCon 2011, July 25-27, Portland, OR, 2011. CD Proceedings.

Earnhart, N.E. Marek, K.A. and Cunefare, K.A. "Passive Noise Control in Fluid Power." 52nd National Conference on Fluid Power, Las Vegas NV, March 2011. CD Proceedings.

Earnhart, N.E., Marek, K.A. and Cunefare, K.A. "Novel, Compact Devices for Reducing Fluid-Borne Noise." Proceedings of 2011 SAE Noise and Vibration Conference, Paper No. 11NVC-0138, Grand Rapids, MI May 2011. CD Proceedings.

Earnhart, N.E., Marek, K.A. and Cunefare, K.A. "Modeling and validation of an in-line hydraulic silencer." Proceedings of the 6th FPNI – PhD Symposium, West Lafayette IN 2010. Vol. 1, p. 101-113. CD Proceedings.

Earnhart, N.E., Marek, K.A. and Cunefare, K.A. "Evaluation of hydraulic silencers." Proceedings of NoiseCon 2010, joint with the 159th Meeting of the Acoustical Society of America, Baltimore, MD, 19-23 April, 2010. CD Proceedings.

Marek, K.A., Earnhart, N.E. and Cunefare, K.A. "Model for the design of a hydraulic silencer with a dispersive liner." Proceedings of NoiseCon 2010, joint with the 159th Meeting of the Acoustical Society of America, Baltimore, MD, 19-23 April, 2010. CD Proceedings.

Earnhart, N.E., Marek, K.A. and Cunefare, K.A. "Evaluation of hydraulic silencers." Proceedings of the 158th Meeting of the Acoustical Society of America, San Antonio, TX, 26-30 October 2009.

Marek, K.A., Earnhart, N.E., Cunefare, K.A. "Numerical model for a hydraulic in-line silencer with dispersive lining." Proceedings of the 158th Meeting of the Acoustical Society of America, San Antonio, TX, 26-30 October 2009.



Other Presentations & Publications

Earnhart, N.E. "Engineering Skills in Investigations." Invited Lecture for Kennesaw State University CrJu 3320 – Criminal Investigation, Kennesaw, GA, April 2022 and May 2023.

Earnhart, N.E. "The Basics of Accident Reconstruction." Invited Lecture for Continuing Legal Education. The Champion Firm, Marietta, GA, February 2023.

Earnhart, N.E. "The ABCs of ADAS." Invited Lecture for the 2020 Alabama Association for Justice Mid-Winter Conference, Birmingham, AL, January 2020.

Earnhart, N.E. "Accident Reconstruction: Modern Technology & Data Sources." Invited Lecture for the ICLE 34th Annual Insurance Law Institute, St. Simons Island, GA, September 2015.

Earnhart, N.E. and Cunefare, K.A. "Cancelling noise at its source." Hydraulics & Pneumatics Magazine, August 2011.

